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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,419	10/23/2001	Ludwig Ertl	GR99P1708	9767

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EXAMINER	
CHANG, JON CARLTON	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/014,419	ERTL ET AL.	
	Examiner	Art Unit	
	Jon Chang	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 5-11* is/are rejected.

7)☒ Claim(s) *3 and 4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Priority

1. Applicants have not provided a copy international application PCT/EP00/02961, to which Applicants are claiming benefit of priority. Pursuant to MPEP 1895, the Examiner requires Applicants to provide a copy of the PCT application in order to perfect Applicants' claim for benefit under 35 U.S.C. 120 and 365(c).

Specification

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The specification does not provide proper antecedent basis for the language in claim 5, " a frame storage device storing evaluation software."

Claim Rejections - 35 USC § 112

3. Claims 5-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 5 requires "a frame storage device storing evaluation software." This is not adequately explained or supported in the specification. The disclosure does not explain how a frame storage device stores software. As known in the art, a frame

storage device stores image frames, not software. Applicants' specification, at page 10, lines 15-17, states, "...a control device 16 in which the necessary software is stored and which has a frame store 18..." This indicates that the software is stored in the control device, but not in the frame store.

4. Claims 8-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 8, "said camera has optics that register..." This language is vague as to its meaning.

Claim 9 depends from claim 8.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-2, 5-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 6,198,998 to Farmer et al. (hereinafter "Farmer") and U.S. Patent 5,987,154 to Gibbon et al. (hereinafter "Gibbon").

Regarding claim 1, Farmer generally discloses a method for determining the position of a moveable object within a given area (Fig.4(b); column 2, lines 55-59). Farmer implies taking a sequence of images (frames) of a given area and calculating a current position of an object in the given area by electronically evaluating the images of the sequence (note flowchart in Fig.6; image is taken at step 100, and after subsequent processing as well as the optimized deployment control in step 118, another image is taken, etc.).

Farmer does not disclose that the frames are taken with a video camera, and further does not disclose:

comparing a currently taken one of the frames with a previously stored one of the frames to produce a differential image in which a contour of the object appears only when the object moves; and

calculating the position of the object based on the differential image.

However, these features are well know in the art. For example, Gibbon teaches taking frames with a video camera (Fig.1; column 3, lines 1-2). Gibbon further discloses:

comparing a currently taken one of the frames with a previously stored one of the frames to produce a differential image in which a contour of the object appears only when the object moves (column 1, lines 39-42; column 3, lines 2-5, 9-13 and 66-67); and

calculating the position of the object based on the differential image (this is inherent since the object, i.e., a person, is segmented from the background by this process, column 3, lines 18-20 and 46-47).

Both Farmer and Gibbon are concerned with locating the position of a person in a sequence of images. Gibbon provides for an improved system for identifying a person in a sequence of images (column 1, lines 31-32), and would inherently allow more accurate position determination if the person is moving. Note in particular that Farmer is concerned with motion of the person (column 6, lines 23-24). Additionally, use of a video camera would provide easy and inexpensive way for providing image sequences. Farmer actually states that various types of cameras may be used (column 4, line 49). Therefore, it would have been obvious to one of ordinary skill in the art to modify Farmer's invention according to the teachings of Gibbon.

With regard to claim 2, Farmer further discloses the method according to claim 1, wherein the object is a head of a front seat passenger in a vehicle (note in Fig.4(b) for example, the image of the occupant includes the head).

Regarding claim 5, while keeping in mind the rejection under 35 U.S.C. 112 first paragraph, Farmer discloses a device for determining the position of a moveable object within a given area (column 2, line 52), comprising:

control unit with a computer unit (Fig.1, elements 18, 24; column 3, line 63; note that programming in a processor implies a computer); and

storage device storing evaluation software (Fig.1, inherent in the processor 18 or in memory 21).

Farmer does not disclose a video camera with a defined frame sequence time. However, this is well know in the art. For example, Gibbon teaches taking frames with a video camera (Fig.1; column 3, lines 1-2). A video camera inherently has a defined frame sequence time.

Both Farmer and Gibbon teach software for performing the method of claim 1 (see remarks for claim 1, and note that Farmer utilizes a programmed processor, column 3, line 63, to execute image processing algorithms, and Gibbon teaches a computer with storage and central processing unit, column 2, lines 35-36, which also inherently includes software).

Regarding claim 6, neither Farmer nor Gibbon disclose a frame storage device which has a capacity for storing at least five frames. This is not seen as a patentable distinction. The Examiner takes Official Notice that frame storage devices which have a capacity for storing at least five frames is well known in the art. A frame storage device which has the capacity for storing at least five frames would inherently allow faster or more efficient determination of the motion/trajectory of a person. This would be important for airbag deployment, to which Farmer is concerned. It would therefore have been obvious to one of ordinary skill in the art to utilize a frame storage device which has the capacity for storing at least five frames.

Regarding claim 7, Farmer discloses the device according to claim 5, wherein said camera is a camera selected from the group consisting of a CCD camera and a CMOS camera (column 5, line 18).

As to claim 8, as best understood, Farmer discloses the device for determining the position of a moveable object according to claim 5, wherein:

the object is a head of a passenger in a front seat of a vehicle having a dashboard (Fig.4(b); note the head of a passenger, and the instrument panel, which is a dashboard);

said camera (a video camera in view of Gibbon) has an optical axis (a camera inherently has an optical axis) and is configured such that the optical axis is aligned approximately perpendicularly with respect to a plane in which movements of the passenger normally take place between the front seat and the dashboard (Fig.3); and

said camera has optics that register at least approximately in a region between the passenger and the dashboard (Fig.3).

As to claim 9, Farmer discloses the device according to claim 8, comprising:

an airbag control device activated dependent on a prediction of when the head of the passenger will penetrate into a hazard range (column 6, lines 40-62);

said prediction based on a trajectory of the head and a speed of the head (column 6, lines 25-26, 40-41).

Regarding claim 11, Farmer discloses the device according to claim 5, wherein said control device receives an emergency braking signal when an emergency braking occurs (column 6, lines 33-38).

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Farmer, Gibbon and U.S. Patent 5,528,698 to Kamei et al. (hereinafter "Kamei").

Regarding claim 10, Farmer discloses the device according to claim 5, comprising an infrared light source (column 4,lines 44-47). Farmer does not disclose the camera is provided with a filter that cuts out wavelengths below a near infrared spectrum range. However, this is well known in the art. For example, in the same environment, Kamei teaches a near infrared filter for a camera (column 5, lines 17-20). It would have been obvious to one of ordinary skill in the art to utilize a filter that cuts out wavelengths below a near infrared spectrum range because this would eliminate undesired wavelengths of extraneous light which may contribute to noise in the system, thereby improving processing of the images.

Allowable Subject Matter

8. Claims 3 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

References Cited

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,974,175 to Suzuki discloses an image processing apparatus and method which detects a contour of an object fro a sequence of images.

U.S. Patent 5,983,147 to Krumm discloses a video occupant detection system which utilizes a video camera and takes the difference between sequential range images.

U.S. Patent 6,118,887 to Cosatto et al. discloses a method for tracking heads and faces which determines the outlines of heads using motion analysis.

U.S. Patent 6,128,396 to Hasegawa et al. teaches an inter-frame difference calculating section which calculates the difference between the two frames to determine a moving object.

U.S. Patent 6,141,432 to Breed et al. discloses a vehicle interior monitoring system to locate and monitor occupants.

U.S. Patent 6,160,901 to Kage teaches taking the difference between two sequential images for estimating the direction of bearing of motion of a moving object.

U.S. Patent 6,608,910 to Srinivasa et al. discloses a computer vision method and apparatus for recognizing and tracking occupants in a vehicle for airbag control.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon Chang whose telephone number is (703)305-8439. The examiner can normally be reached on M-F 8:00 a.m.-6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

Jon Chang
Primary Examiner
Art Unit 2623

Jon Chang
September 30, 2003